

# COUNTY OF SONOMA PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

### RESIDENTIAL

#### 2010 CALGreen + Tier 1 Checklist

(Applies to <u>newly constructed</u> hotels, motels, lodging houses, dwellings, dormitories, condominiums, shelters, congregate residences, employee housing, factory-built housing and other types of dwellings with sleeping accommodations and new accessory buildings associated with such uses. Additions, alterations, repairs and existing structures are not subject to the requirements of CALGreen. Existing site and landscaping improvements that are not otherwise disturbed are also not subject to the requirements of CALGreen.)

#### APPENDIX A4 - Section A4.602

(Revised per County of Sonoma Requirements - Based on CALGreen + Tier 1)

Project Name:	
Project Address:	
Project Description:	

#### Instructions:

- The owner/owner's agent and the design professional as required shall initially complete Columns 1 and 2 of
  this checklist, sign and date the Design Verification section at the end of this checklist for submission of permit
  application. PRMD plans examiners shall review checklist for compliance. The approved checklist shall be
  printed on the project plans as a prerequisite for plan approval.
- 2. Prior to final inspection by the Building Department, the Building Inspector shall complete **Column 3** and sign or initial, and date **the Implementation Verification** section at the end of this checklist.

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
A4.1 PLANNING AND DESIGN	All checked items are required for the project	Select at least two (2) elective measures from A4.1	Measures verified in the completed project by inspector
1	items are required for	least two (2) elective measures	in the completed project by

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
Site Preservation			
A4.104.1 An individual with oversight responsibility for the project has participated in an educational program promoting environmentally friendly design or development and has provided training or instruction to appropriate entities.			
Deconstruction and Reuse of Existing Materials			
A4.105.2 Existing buildings are disassembled for reuse or recycling of building materials. The proposed structure utilizes at least one of the following materials which can be easily reused:  1. Light fixtures  2. Plumbing fixtures			Verify at least one if required
3. Doors and trim			
4. Masonry			
5. Electrical devices			
<ul><li>6. Appliances</li><li>7. Foundations or portions of foundations</li></ul>			
Site Development			
<b>4.106.2</b> A plan is developed and implemented to manage storm water drainage during construction.	×		
<b>4.106.3</b> Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.			
<b>A4.106.1</b> Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south.			
<b>A4.106.2.1</b> Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.			

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
<b>A4.106.2.2</b> Soil disturbance and erosion are minimized by at least one of the following:			
Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy.			
Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.			
Underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed and the soil is replaced using accepted compaction methods.			
A4.106.2.3 Displaced topsoil is stockpiled for reuse and protected.	$\boxtimes$		
A4.106.2.3 The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area.			
A4.106.3 Post construction landscape designs accomplish one or more of the following:			
Areas disrupted during construction are restored to be consistent with native vegetation			
2. Limit turf areas to not more than 50 percent (Tier 1).			
Utilize at least 75 percent native Californian or drought tolerant plant and tree species appropriate for the climate zone region.			
Hydrozoning irrigation techniques are incorporated into the landscape design.			
A4.106.4 Permeable paving is utilized for not less than 20 percent of the total parking, walking, or patio surfaces. Review section for exceptions. (Tier 1)			
A4.106.5 Roofing materials shall have a minimum 3-year aged solar reflectance and thermal emittance or a minimum aged Solar Reflectance Index (SRI) equal to or greater than the values specified in Tables 4.1.6.5(1). Required only for roof slopes > 2:12 and roof weights > 5psf. (Tier 1)			
A4.106.6 Electric vehicle charging. Provide capability for dedicated electrical vehicle supply equipment in single-family and multifamily structures.			

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
Innovative Concepts and Local Environmental Conditions			
A4.107.1 Items in this section are necessary to address innovative concepts or local environmental conditions These items must be approved by the Building Department prior to listing here.			
Item 1:			
Item 2:			
Item 3:			
A4.2 ENERGY EFFICIENCY	All checked items are required	Select at least four (4) elective measures from A4.2	Measures verified in the completed project by inspector
Performance Approach General			
A4.203.1 Low-rise residential buildings use at least 15 percent less Time-Dependent Valuation (TDV) Energy than the 2008 Title 24 Building Energy Efficiency Standards "budget" building. No calculations are required to demonstrate any specified reduction in CO2 emissions. (Tier 1)			
Building Envelope			
A4.205.1 Radiant roof barrier is installed in Climate Zone 2.			
A4.205.2 Exterior shading at least 18 inches in depth is provided on south and west windows.			
Air Sealing Package			
<b>A.4.206.1</b> Third party blower door test is conducted and passed to verify building envelope tightness.			Special Inspection required

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
HVAC Design, Equipment and Installation			
A4.207.1 Radiant, hydronic, ground source and other innovative space heating and cooling systems included in the proposed design shall be designed using generally accepted industry-approved guidelines and design criteria.			
A4.207.2.2 An HVAC system commissioning plan is developed and the following items, as appropriate, pertaining to the heating and cooling systems are inspected and certified by an independent third party agency:			
Verify compliance with the manufacturers recommended start-up procedures.			
<ol><li>Verify refrigerant charge by super-heat or other methods specified by the manufacturer.</li></ol>			
3. Burner is set to fire at the nameplate input rating.			
Temperature drop across the evaporator is within the manufacturers recommended range.			
5. Test and verify air flow to be within 10 percent of the initial design air flow.			
<ol><li>Static pressure within the duct system is within the manufacturers' acceptable range.</li></ol>			
<ol><li>Verify that the whole house and exhaust ventilation systems meet Title 24 requirements.</li></ol>			
Verify that the recommended maintenance procedures and schedules are documented and provided to the home owner.			Special Inspection required
A4.207.2.3 Results of the commissioning inspection shall be included in the Operation and Maintenance Manual required in Section 4.4.10.1.			
<b>A4.207.4</b> Install gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of 0.90 or higher.			
A4.207.5 If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.			

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
A4.207.6 When climatic conditions necessitate the installation of cooling equipment, select cooling equipment with a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0 and an Energy Efficiency Ratio (EER) of at least 11.5.			
<b>A4.207.7</b> Install ductwork to comply with at least one of the following:			
Install ducts within the conditioned envelope of the building.			
2. Install ducts in an underfloor crawl space.			
3. Use ducts with an R-6 insulation value or higher.			
4. Install ductwork which is buried in the ceiling insulation.			
A4.207.8 Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow.			Special Inspection required
<b>A4.207.9</b> In climate zone 2, install a whole-house fan with insulated louvers or an insulated cover.			
A4.207.10 ENERGY STAR ceiling fans are installed in all bedrooms and living areas.			
Water Heating Design, Equipment and Installation			
<b>A4.208.1</b> The Energy Factor (EF) for a gas fired storage water heater is higher than 0.60.			
A4.208.2 The Energy Factor (EF) for a gas fired tankless water heater is 0.80 or higher.			
A4.208.3 Where the hot water source is more than 10 feet from a fixture, the potable water distribution system shall convey hot water using a method designed to minimize wait time for hot water to arrive at the fixture.			
Lighting			
A4.209.1 Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures.			
Appliances			

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
A4.210.1 Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.			
Renewable Energy			
<b>A4.211.1</b> Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP). Install energy efficiency measures meeting Tier I which exceeds the 2010 <i>California Energy Code</i> requirements by 15 percent.			
Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II.			
<sup>1</sup> In addition each appliance provided by the builder must be Energy Star if an Energy Star designation is applicable for that appliance.			
<sup>2</sup> Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website: www.GoSolarCalifornia.ca.gov/nshp/index.html.			
A4.211.2 A solar water heating system is installed.			
<b>A4.211.3</b> Space on the roof surface and penetrations through the roof surface are provided for future solar installation.			
<b>A4.211.4</b> A minimum one inch conduit is provided from the electrical service equipment for the future installation of a photovoltaic (PV) system.			
Innovative Concepts and Local Environmental Conditions			
<b>A4.213.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions. These items must be approved by the Building Department prior to listing here.			
Item 1:			
Item 2:			
Item 3:			

<u>Column 1</u> Feature or Measure	Column 2 Project Requirements When checked, these items become a part of the approved plans and must be installed or incorporated into the project.		Column 3 Verification Complete after installation & prior to final inspection approval
See Chapter 4 and Appendix A4 of the 2010 California Green Building Code for complete descriptions of features or measures listed here.	Mandatory & Tier 1 Prerequisites	Tier 1 electives Applicant selects required elective measures	Verification by Building Inspector or Special Inspector as noted
A4.3 WATER EFFICIENCY AND CONSERVATION	All checked items are required	Select at least one (1) elective measure from A4.3	Measures verified in the completed project by inspector
Indoor Water Use			
<ul> <li>4.303.1 Indoor water use shall be reduced by at least 20 percent using one of the follow methods.</li> <li>Water saving fixtures or flow restrictors shall be used per</li> </ul>	7/01/2011 <sup>3</sup>		
Table 4.303.2.  A 20 percent reduction in baseline water use shall be demonstrated per Table 4.303.1.			
<b>4.303.2</b> When using the calculation method specified in Section 4.303.1, multiple showerheads controlled by a single valve shall not exceed maximum flow rates.	⊠ 7/01/2011 <sup>3</sup>		
<b>4.303.3</b> Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with specified performance requirements.	⊠ 7/01/2011 <sup>3</sup>		
A4.303.1 Kitchen sink faucet shall have a maximum flow rate not greater than 1.5 gallons per minute at 60 psi.			
A4.303.2 Non-water supplied urinals or waterless toilets are installed.			
	Γ		
Outdoor Water Use <sup>4</sup>			
<b>4.304.1</b> Automatic irrigation systems installed at the time of final inspection shall be weather-based.			
A4.304.1 Install a low-water consumption irrigation system which minimizes the use of spray type heads.			
A4.304.2 rainwater capture, storage and re-use system is designed and installed.			

 $<sup>^3</sup>$  Applies to permit applications submitted on or after 7/1/11.  $^4$  Refer to SCC 7-D3 "Water Efficient Landscape" for other residential requirements,

<b>A4.304.3</b> A water budget shall be developed for landscape irrigation.			
<b>A4.304.4</b> Provide water efficient landscape irrigation design where potable water use does not exceed 65% of ETo.(Tier 1)	$\boxtimes$		
<b>A4.304.5</b> A landscape design is installed which does not utilize potable water.			
WATER REUSE SYTEMS			
<b>A4.305.1</b> Piping is installed to permit future use of a graywater irrigation system served by the clothes washer or other fixtures.			
A4.305.2 Recycled water piping is installed.			
A4.305.3 Recycled water is used for landscape irrigation.			
Innovative Concepts and Local Environmental Conditions			
<b>A4.306.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions. These items must be approved by the Building Department prior to listing here.			
Item 1:			
Item 2:	П	П	
1011 2.			
Item 3:			
			Measures verified in the completed project by inspector
Item 3:  A4.4 Material Conservation And Resource	All checked items are	Select at least two (2) elective measures	in the completed project by
A4.4 Material Conservation And Resource Efficiency	All checked items are	Select at least two (2) elective measures	in the completed project by
A4.4 Material Conservation And Resource Efficiency  Foundation Systems  A4.403.1 A Frost-Protected Shallow Foundation (FPSF) is	All checked items are	Select at least two (2) elective measures from A4.4	in the completed project by inspector
A4.4 Material Conservation And Resource Efficiency  Foundation Systems  A4.403.1 A Frost-Protected Shallow Foundation (FPSF) is designed and constructed.  A4.4.3.2 Cement use in foundation mix design is reduced by	All checked items are required	Select at least two (2) elective measures from A4.4	in the completed project by inspector
A4.4 Material Conservation And Resource Efficiency  Foundation Systems  A4.403.1 A Frost-Protected Shallow Foundation (FPSF) is designed and constructed.  A4.4.3.2 Cement use in foundation mix design is reduced by not less than a 20 percent. (Tier 1)	All checked items are required	Select at least two (2) elective measures from A4.4	in the completed project by inspector
A4.4 Material Conservation And Resource Efficiency  Foundation Systems  A4.403.1 A Frost-Protected Shallow Foundation (FPSF) is designed and constructed.  A4.4.3.2 Cement use in foundation mix design is reduced by not less than a 20 percent. (Tier 1)  Efficient Framing Techniques  A4.404.1 Beams and headers and trimmers are the minimum	All checked items are required	Select at least two (2) elective measures from A4.4	in the completed project by inspector

<b>A4.404.4</b> Material lists are included in the plans which specify material quantity and provide direction for on-site cuts.		
Material Sources		
A4.405.1 One or more of the following building materials, that do not require additional resources for finishing are used:  Exterior trim not requiring paint or stain.  Windows not requiring paint or stain.  Siding or exterior wall coverings which do not require		
paint or stain.		
<b>A4.405.2</b> Floors that do not require additional coverings are used including but not limited to stained, natural, or stamped concrete floors.		
<b>A4.405.3</b> At least 10 percent of the materials for the project shall have a post-consumer or pre-consumer recycled content value (RCV) not less than 10 percent. (Tier 1)		
A4.405.4 Renewable source building products are used.		
Enhanced Durability and Reduced Maintenance		
<b>4.406.1</b> Annular spaces around pipes, electric cables, conduits, or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or similar method acceptable to the enforcing agency.		
Water Resistance and Moisture Management		
A4.407.1 Install foundation and landscape drains.		
<b>A4.407.2</b> Install gutter and downspout systems to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, rainwater capture system or other approved on-site location.		
<b>A4.407.3</b> Provide flashing details on the building plans and comply with accepted industry standards or manufacturers instructions.		
<b>A4.407.4</b> Protect building materials delivered to the construction site from rain and other sources of moisture.		
<b>A4.407.6</b> Exterior doors to the dwelling are protected to prevent water intrusion.		
<b>A4.407.7</b> A permanent overhang or awning at least 2 feet in depth is provided.		

Construction Waste Reduction, Disposal and Rec	ycling			
<b>4.408.1</b> Recycle and/or salvage for reuse a minimum percent of the nonhazardous construction and demol waste in accordance with one of the following:				
Comply with a more stringent local construc demolition waste management ordinance; o				
A construction waste management plan per     4.408.2 or	Section			
A waste management company per Section or	4.408.3;			
4. The waste stream reduction alternative per 4.408.4.	Section			
A4.408.1 Construction waste generated at the site is to recycle or salvage in compliance with one of the form				
1. Tier I at least a 65 percent reduction				
<ol> <li>Tier 2 at least a 75 percent reduction         Exception: Equivalent waste reduction met developed by working with local agencies.     </li> </ol>	thods are			
Building Maintenance and Operation				
<b>4.410.1</b> An operation and maintenance manual shall provided to the building occupant or owner.	be			
Innovative Concepts and Local Environmental Co	onditions			
A4.411.1 Items in this section are necessary to address innovative concepts or local environmental conditions				
Item 1:				
Item 2:				
Item 3:				
A4.5 ENVIRONMENTAL QUALITY		All checked items are required	Select at least one (1) elective measure from A4.5	Measures verified in the completed project by inspector
Fireplaces <sup>5</sup>				
<b>4.503.1</b> Install only a direct-vent sealed-combustion of appliance, pellet burning appliance, or wood burning appliance compliant with USEPA Ph II certified.	gas			
Pollutant Control <sup>6</sup>				

 $<sup>^{5}</sup>$  Refer to SCC Ch 7C "Wood Burning Appliances" for applicable local ordinance and Technical Bulletin B-35 "Masonry Fireplaces"

<b>4.504.1</b> Duct openings and other related air distribution component openings shall be covered during construction.		
<b>4.504.2.1</b> Adhesives, sealants and caulks shall be compliant with VOC and other toxic compound limits.		
<b>4.504.2.2</b> Paints, stains and other coatings shall be compliant with VOC limits.		
<b>4.504.2.3 Aerosol</b> paints and coatings shall be compliant with product weighted MIR limits for ROC and other toxic compounds.		
<b>4.504.2.4</b> Documentation shall be provided to verify that compliant VOC limit finish materials have been used.		
<b>4.504.3</b> Carpet and carpet systems shall be compliant with VOC limits.		
4.504.4 50 percent of floor area receiving resilient flooring shall comply with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) High Performance Products Database or be certified under the Resilient Floor covering Institute (RFCI) FloorScore program; or meet California Dept. of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers", Version 1.1, February 2010 (also known as Specification 01350).		
<b>4.504.5</b> Particleboard, medium density fiberboard (MDF), and hardwood plywood used in interior finish systems shall comply with low formaldehyde emission standards.		
A405.4.1 Meet the formaldehyde limits contained in Table4.5.4.6 before the mandatory compliance date, or use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.		
A405.4.2 Install VOC compliant resilient flooring systems. At least 80 percent of the resilient flooring installed shall comply. (Tier 1)		
A4.504.3 Thermal insulation installed in the building shall meet the following requirements:		
Install thermal insulation in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List. (Tier 1)		
Interior Moisture Control		
<b>4.505.2</b> Vapor retarder and capillary break is installed at slab on grade foundations.		
<b>4.505.3</b> Moisture content of building materials used in wall and floor framing is checked before enclosure.		
Indoor Air Quality and Exhaust	 	

<b>4.506.1</b> Exhaust fans which terminate outside the building are provided in every bathroom.	$\boxtimes$	
<b>A4.506.1</b> Higher than MERV 6 filters are installed on central air or ventilation systems.		
<b>A4.506.2</b> Direct vent appliances are used or isolated from the conditioned space.		
Environmental Comfort		
<b>4.507.1</b> Whole house exhaust fans shall have insulated louvers or covers which close when the fan is off. Covers or louvers shall have a minimum insulation value of R-4.2.		
<b>4.507.2.</b> Duct systems are sized and designed and equipment is selected using the following methods:		
1. Establish heat loss and heat gain values according to ANSI/ACCA 2 Manual J-2004 or equivalent.		
2. Size duct systems according to ANSI/ACCA 1 Manual D-2009 or equivalent.		
3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S-2004 or equivalent.		
Innovative Concepts and Local Environmental Conditions		
<b>A4.509.1</b> Items in this section are necessary to address innovative concepts or local environmental conditions.		
Item 1:		
Item 2:		
Item 3:		
INSTALLER AND BUILDING INSPECTOR QUALIFICATIONS		Measures verified in the completed project by inspector
Qualifications		
<b>702.1</b> HVAC system installers are trained and certified in the proper installation of HVAC systems.		
<b>702.2</b> Building inspectors employed by the enforcing agency must be qualified and able to demonstrate competence in the discipline they are inspecting.		
Verifications		 

measures and prior to final inspection approval.
--

## **Green Building Acknowledgments**

pleted checklist (Columns 1 and 2) with the plan
Examiner have reviewed the plans and the project plans and will be implemented e 2010 California Green Building Standards
Date
Date
Date
together with all original signatures on Section 2 and Department final inspection.  to verify and certify that the project wilding Checklist and in accordance with the dards Code.
Date
Date